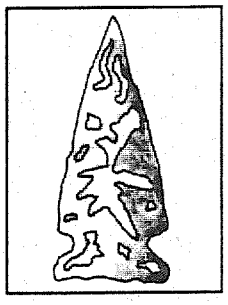
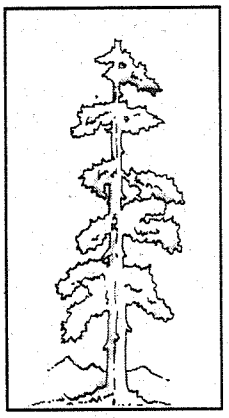
DELINEATION OF POTENTIALLY JURISDICTIONAL WATERS OF THE UNITED STATES AT THE PROPOSED IN-SITU LEACHING SITE NEAR FLORENCE, ARIZONA

MAGMA COPPER COMPANY
FLORENCE IN-SITU LEACHING PROJECT

ACOE FILE #95-40306-00-MB

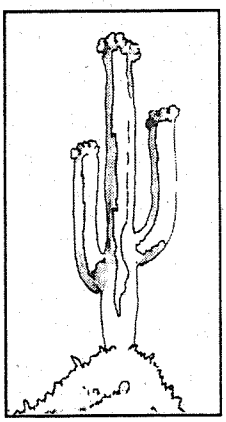




Submitted to

MAGMA COPPER COMPANY

Submitted by



SWCA, INC.
Environmental Consultants

JUNE 1995

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June 30, 1995

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EXECUTIVE SUMMARY

To facilitate compliance with Section 404 of the Clean Water Act, a delineation of potentially jurisdictional waters of the United States was conducted at Magma Copper Company's approximately 620-acre proposed in-situ leaching site near Florence, Arizona (Figure 1). Waters delineation fieldwork involved identifying the lateral boundaries of potentially jurisdictional drainages on the property, as determined by the ordinary high water line. The ordinary high water line was identified by the presence of any of the following characteristics: a well-defined channel as indicated by an incision, debris line, sandy wash bottom, or a change in vegetation. The acreage of potentially jurisdictional waters within the project area was determined by multiplying the mean width of the drainage by the length of the drainage. The total acreage of potentially jurisdictional waters on the property is 0.4 acres; of this acreage, 0.2 acres occurs in drainages with an average width of 5 feet or greater. No potentially jurisdictional wetlands occur in the study area.

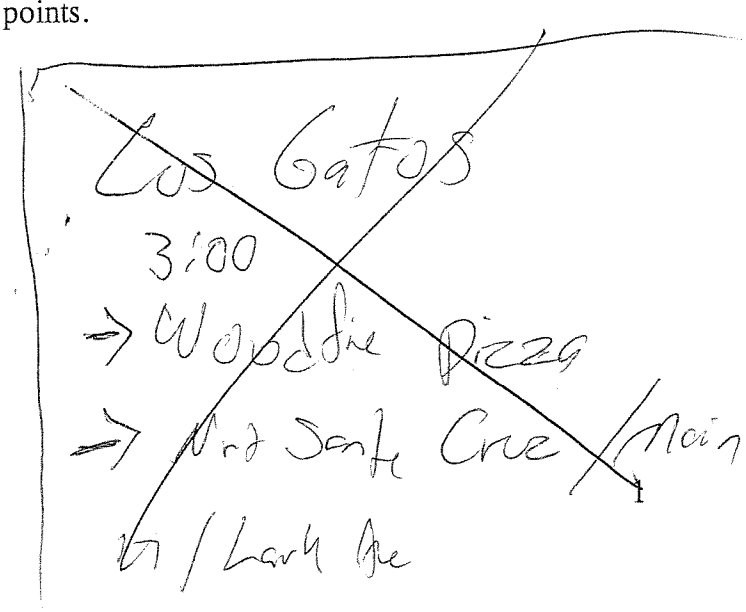
1.0 INTRODUCTION

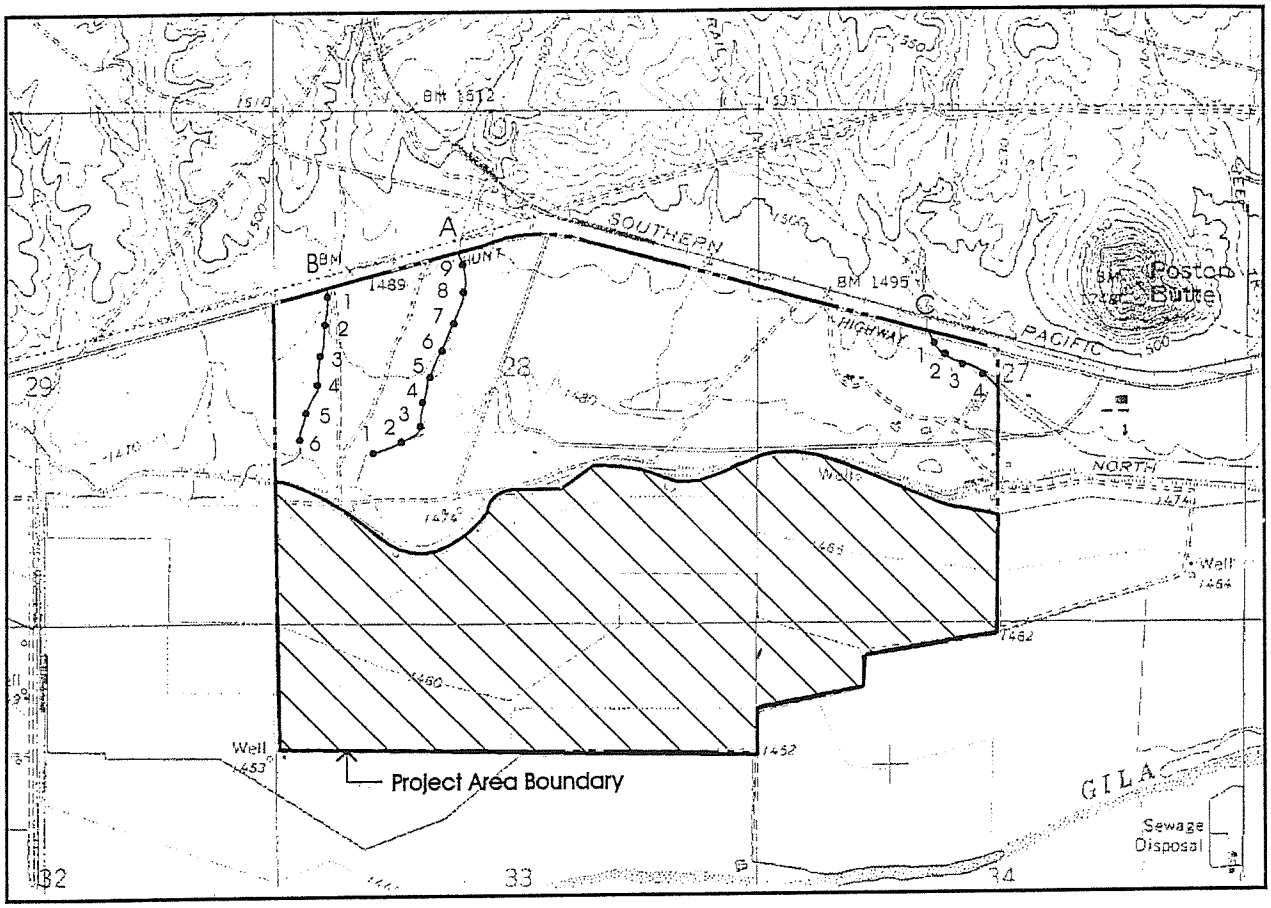
To facilitate compliance with Section 404 of the Clean Water Act, a delineation of potentially jurisdictional waters of the United States was conducted at Magma Copper Company's approximately 620-acre proposed in-situ leaching site near Florence, Arizona.

The property lies approximately one half mile north of the Gila River, and is relatively flat with only 30 feet of elevation change (Figure 1). Surface water drainages are ephemeral, and generally flow from north to south (toward the Gila River). Natural drainage patterns have been extensively altered by the presence of culverts, elevated roads and berms on the property. The southern half of the area is irrigated agriculture fields.

2.0 METHODS

Waters delineation fieldwork involved on-site measurement of the area of normal high waters within drainages on the property. Prior to field delineation, potentially jurisdictional drainages were identified and labeled on the Florence, Arizona USGS 1:24,000 scale topographic map. The width of each potentially jurisdictional drainage (as indicated by ordinary high water mark) was measured on-site to the nearest half-foot at sample points that were approximately 200-ft apart. Ordinary high water was identified by the presence of one or more of the following characteristics: a well-defined channel as indicated by an incision, debris line, sandy wash bottom, scour line, water stains on bedrock, or a change in vegetation. A photograph was taken (looking upstream) of the channel bottom at every other sample point. Figure 1 shows the approximate locations of sample points along each drainage. The area of each drainage is calculated in square feet by multiplying the mean width of the drainage by the length of the drainage (measured in the field via pacing). Area is converted to acreage by dividing by 43,560 square feet per acre. Figure 2 (in pocket) is an aerial photoreproduction (1"=500'; March 1995) that depicts sample point locations and the channel width at those points.





0 2000' 4000'
feet

0 .5 1.0
miles

Sample Point and Number

Natural Drainages

Area Under Irrigation

Project Location

Magma Copper Company
Proposed In-Situ Leaching
Project.

Figure 1.
Project Location Map and
Approximate Location of Sample Points.

SWCA Inc.
Environmental Consultants

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3.0 RESULTS

Table 1 shows the total length (ft), mean width (ft), and area (ac) of potentially jurisdictional waters of the U.S. for the drainages within the study area. The total acreage of potentially jurisdictional waters on the property is 0.4 acres; of this acreage, 0.2 acre of channel occurs in drainages with average width of 5 feet or greater. The supporting field data for delineations (channel width, indicator(s) of ordinary high water mark, and dominant riparian and upland vegetation at each sample point) have been transcribed and are provided in Appendix A. Supporting photodocumentation for selected points along the drainages within the project area is provided as Appendix B. Field reconnaissance did not indicate the presence of potentially jurisdictional wetlands. A brief discussion of the waters data and field observations follows.

Table 1. Approximate length, average width, and approximate acreage of natural drainages in the study area.

Drainage ID	Length (ft)	Mean Width (ft)	Area (ac)
A	1860	5.3	0.2
B	1300	3.3	0.1
C	800	4.8	0.1
Total Acreage:			**0.4**

Drainages A and B (Figure 1) enter the study area through culverts beneath the Hunt Highway. Immediately downstream of the culverts, both drainages have discernable channels that become more shallow and narrow as they progress downstream. Drainage C also enters the project area through a culvert buried beneath the Hunt Highway (Figure 1). For approximately 200 feet, the ordinary high water mark defines a 5-foot channel width (Appendix B, Drainage C Point 1) before entering a densely vegetated area that lacks a discernable channel. Although there was no direct evidence of standing water in this area, greater vegetation volume relative to surrounding areas, and lack of a discernable channel suggest that water may temporarily collect in this zone of the drainage (Figure 1, Drainage C Point 2). Immediately downstream of the disturbed area, drainage C is confined between two man-made berms (that are approximately six feet high and 65 feet apart) for approximately 400 feet, then appears to be partially impounded by a culvert beneath a road (the eastern property boundary ends at this road). With the exception of Drainage C, surface flows appear to end on-site, especially since there are no tributaries to Drainages A, B, and C.

APPENDIX A

TRANSCRIBED DATA SHEETS FOR WATERS DELINEATIONS AT THE PROPOSED IN-SITU LEACHING SITE

Appendix A. Sample Point Data

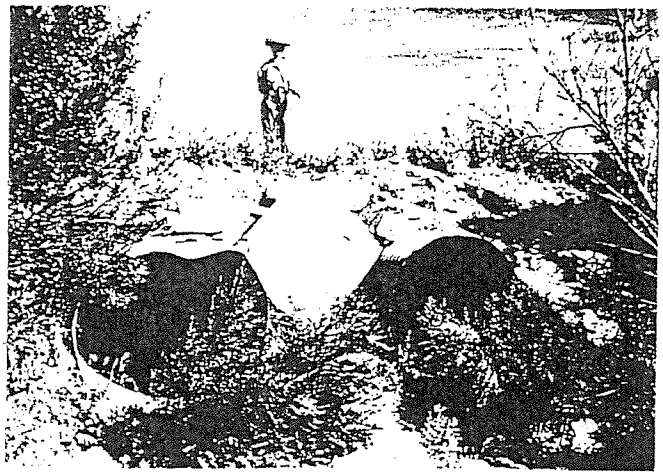
Point	Width (ft)	Indicators	Upland Vegetation	Riparian Vegetation
Drainage A; Average width = 5.3 feet				
1	5	Rock cobbles, debris, slight incision	*Larrea tridentata*, *Carnegiea gigantea*, *Bromus rubens*	*Lycium* species, *Olneya tesota*, *Cercidium floridum*, *Prosopis juliflora*, *Larrea tridentata*, *Bromus rubens*, *Baccharis sarothroides*
2	5	Debris line, sandier substrate	*Larrea tridentata*, *Bromus rubens*	*Cercidium floridum*, *Bromus rubens*
3	5	Shallow swale, slight incision	*Larrea tridentata*, *Bromus rubens*, Scorpion weed	*Prosopis juliflora*, *Larrea tridentata*
4	3	Slight incision, sandy bottom	*Larrea tridentata*, *Prosopis juliflora*, *Bromus rubens*	*Bromus rubens*, *Acacia greggii*
5	3.5	Incision, sandy bottom	*Larrea tridentata*, *Cercidium floridum*, *Bromus rubens*	*Cercidium floridum*, *Bromus rubens*
6	3/3 (split channel)	Debris line, cobbles line, sandy substrate	*Larrea tridentata*, *Bromus rubens*	*Larrea tridentata*, *Bromus rubens*
7	6	Incised channel, rockier substrate	*Bromus rubens*, *Larrea tridentata*	*Cercidium floridum*, *Bromus rubens*, *Acacia greggii*
8	8	Channel incision and wide swale veg. line	*Acacia greggii*, *Larrea tridentata*	*Bromus rubens*, *Prosopis juliflora*
9	6	Cobble substrate, slightly incised channel	*Acacia greggii*, *Larrea tridentata*, *Bromus rubens*	*Acacia greggii*, *Larrea tridentata*, *Bromus rubens*, *Baccharis sarothroides*, *Prosopis juliflora*
Drainage B; Average width = 3.3 feet				
1	4	Cobble substrate, slight incision	*Larrea tridentata*	*Ambrosia deltoidea*, *Bromus rubens*, *Larrea tridentata*, *Cercidium floridum*
2	4	Cobbles, slight incision	*Larrea tridentata*, *Ambrosia deltoidea*	*Bromus rubens*, *Larrea tridentata*

Appendix A. Sample Point Data, continued.

Point	Width (ft)	Indicators	Upland Vegetation	Riparian Vegetation
3	4.5	Cobbles, shallow swale	*Larrea tridentata*, *Bromus rubens*	*Larrea tridentata*, *Bromus rubens*
4	3	Shallow swale, cobble substrate	*Larrea tridentata*, *Bromus rubens*, *Prosopis juliflora*	*Larrea tridentata*, *Bromus rubens*
5	2	Slight incision, shallow swale	*Larrea tridentata*, *Bromus rubens*	*Cercidium floridum*, *Baccharis sarothroides*, *Prosopis juliflora*, *Bromus rubens*
6	2.5	Slight incision, wide shallow swale	*Larrea tridentata*, *Bromus rubens*	*Larrea tridentata*, *Bromus rubens*
Drainage C; Average width = 4.8 feet				
1	5	Change in substrate, bank incision, veg. line	*Larrea tridentata*, *Prosopis juliflora*, *Cercidium microphyllum*	*Larrea tridentata*, *Prosopis juliflora*, *Cercidium microphyllum*
2	6	Sandy bottom, channel incision	*Larrea tridentata*, *Prosopis juliflora*, *Cercidium microphyllum*	*Larrea tridentata*, *Prosopis juliflora*, *Cercidium microphyllum*
3	4	Channel incision, veg. line, sandy bottom	*Larrea tridentata*, *Prosopis juliflora*, *Cercidium microphyllum*	*Larrea tridentata*, *Prosopis juliflora*, *Cercidium microphyllum*
4	4	Channel incision, change in substrate	*Larrea tridentata*, *Prosopis juliflora*, *Cercidium microphyllum*	*Larrea tridentata*, *Prosopis juliflora*, *Cercidium microphyllum*

APPENDIX B

PHOTOGRAPHS OF SELECTED SAMPLES POINTS WITHIN DRAINAGES AT THE PROPOSED IN-SITU LEACHING SITE



Drainage A culverts

Drainage A Point 1

Drainage A Point 3

Drainage A Point 5

Drainage A Point 7

Drainage A Point 9

Drainage B Point 1

Drainage B Point 3

Drainage B Point 5

Drainage C Point 1

Drainage C Point 3

Drainage C Point 5